"One Giant Leap [Backwards] for Mankind": Limited Liability in Private Commercial Spaceflight

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“One Giant Leap [Backwards] for Mankind”

LIMITED LIABILITY IN PRIVATE COMMERCIAL SPACEFLIGHT

INTRODUCTION

In 2014, six people aboard Virgin Galactic’s SpaceShipTwo will likely become the first paying customers to fly on a private commercial spacecraft. Passengers on that historic two-and-a-half hour flight will see “spectacular views.”

1 This is an abbreviated version of Neil Armstrong’s iconic first words as he “became the first person ever to step onto another planetary body.” Neil Armstrong: 1930–2012, NASA (Aug. 25, 2012), http://www.nasa.gov/topics/people/features/armstrong_obit.html. Armstrong’s words in their entirety were: “That is one small step for (a) man, one giant leap for mankind.” Id.


3 The flight will be suborbital, which is “spaceflight where the spacecraft reaches outer space, but does not have sufficient energy to complete a full revolution around the Earth before reentering the atmosphere.” Kleinman et al., supra note 2, at 30. While “there is no international agreement on where outer space begins,” see von der Dunk, supra note 2, at 424, for the limited purposes of this discussion, suborbital flight, when it exceeds the Kármán Line, a distance 100 km above sea level, will be termed as spaceflight. Kleinman et al., supra note 2, at 3. The Kármán Line is the “most commonly accepted demarcation between atmosphere and outer space.” Id.

of Earth and experience six minutes of weightlessness in what promises to be a life-changing experience. In that time, the spaceflight participants will be free to unstrap from their seats and “float, tumble, even get married.” But no amount of enthrallment can prevent the inevitable corollary to the private sector’s maiden spaceflight: the first commercial spaceflight-related lawsuit.

As with any lawsuit, the ultimate issue will be liability. And as with any previously unlitigated issue, the proceedings to determine liability will likely be “messy, expensive, and unpredictable.” Given the high costs of the initial flights,

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6 See Overview: Experience, supra note 4 (“[Y]ou know that life will never quite be the same again.”).

7 Warmflash, supra note 5. But some warn that permitting customers to freely maneuver in the cabin during suborbital flights could be dangerous. See, e.g., id. (“‘Unstrapping and re-strapping in such a short time frame would be a risky endeavor,’ says the company’s [XCOR, a private spaceflight company] communications representative, Mike Masse.”).

8 See, e.g., SIMON ADEBOLA ET AL., GREAT EXPECTATIONS—AN ASSESSMENT OF THE POTENTIAL FOR SUBORBITAL TRANSPORTATION: MASTERS 2008 FINAL REPORT 105 (2008), available at http://isulibrary.isunet.edu/opac/doc_num.php?explnum_id=95 (“From an operator’s perspective, it is nearly inevitable that an accident will occur, and companies will be sued.”); Paul Bertorelli, Space Tourism: Big Market, Big Risks, AVWEBINSIDER (Mar. 24, 2012), http://www.avweb.com/blogs/insider/AVWebInsider_Spacetourism_206368-1.html (“Sooner or later, one of these operators will probably [suffer a catastrophic accident] and it’s more likely to happen the higher and faster you fly in untried machines.”).


and the high net worths of the prospective spaceflight participants, legal action against a private commercial spaceflight company could result in million-dollar losses, which could potentially bankrupt the company. Moreover, as a result of the relatively untested technology and risks involved, safety is a major concern. Indeed, approximately four percent of all people who have flown in space have perished. According to Virgin Galactic CEO Richard Branson, “a private program can’t afford to lose anybody.”

The anticipated problems of private commercial spaceflight are compounded by a statutory and regulatory regime that, even before any legal challenges have arisen, has been widely deemed unworkable. The existing system is a mishmash

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15 “Spaceflight is an inherently risky endeavor. Harm can occur at every stage of flight.” KLEINMAN ET AL., supra note 2, at 103-04 (detailing instances of death during the preflight, launch, and reentry phases, and also the possibility for harm to non-participants). See generally KAYSER, supra note 9, at 5-8.

16 Jeff Foust, Weighing the Risks of Human Spaceflight, SPACE REV. (July 21, 2003), http://www.thespaceview.com/article/36/1. Former astronaut Rick Hauck explained his methodology for coming to this conclusion during a May 2003 address at the Woodrow Wilson International Center for Scholars in Washington, DC: 18 out of 430 people who have flown in space died, including 14 on United States operated Space Shuttles, and four on Soviet Union operated Soyuz spacecraft. Id. Additionally, the Space Shuttle program has had a “40% vehicular failure rate.” Carol Pinchefsky, 5 Horrifying Facts You Didn’t Know About the Space Shuttle, FORBES (Apr. 18, 2012), http://www.forbes.com/sites/carolpinchefsky/2012/04/18/5-horrifying-facts-you-didnt-know-about-the-space-shuttle/ (explaining that two out of the total fleet of five Space Shuttles suffered fatal destruction).

17 Buchanan, supra note 14.

18 To be sure, lawsuits concerning events that relate to outer space have been litigated. However, they concerned matters such as the enforceability of liability waivers in satellite launch malfunction cases. See, e.g., Appalachian Ins. Co. v. McDonnell Douglas Corp., 214 Cal. App. 3d 1 (Ct. App. 1989); Martin Marietta Corp. v. Int’l Telecommc’ns Satellite Org., 991 F.2d 94 (4th Cir. 1992). Additionally, courts issued “opinions that address aerospace activities, among other contexts, in terms of contract, tort, property, patent, and even tax law.” Timothy M. Ravich, 2010: Space Law in the Sunshine State, 84 FLA. B.J. 25, 25 (2010) (citations omitted).

19 See, e.g., GÉRARDINE MEISHAN GOH, DISPUTE SETTLEMENT IN INTERNATIONAL SPACE LAW: A MULTI-DOOR COURTHOUSE FOR OUTER SPACE 3, 7 (2007); Frans. G. von der Dunk, Too-Close Encounters of the Third-Party Kind: Will the Liability Convention Stand the Test of the Cosmos 2251-Iridium 33 Collision?, SPACE &
of international agreements, federal statutes and regulations, and state laws which combine to form an asynergistic regime that is simultaneously outdated and untested.

Accordingly, this note will argue that the current body of law governing private commercial spaceflight in the United States is structured in a manner that harms two seemingly inapposite but coterminous interests: (1) the ability of victims to recover damages, and (2) the healthy development of the commercial spaceflight industry. Instead of supporting those interests, the U.S. space law regime encourages short-term economic goals that are ultimately self-defeating.

Space law is rooted in a victim-oriented tradition that dates back to its origins. Since then, the United States Congress has reaffirmed its obligations under international agreements to uphold those ideals as applied to private commercial spaceflight, and high-ranking government officials have expressed their commitment to minimizing risks to individuals involved in these activities. Nevertheless, Congress, by leaving gaps in federal law, has constructively pushed states to pass limited liability statutes, which have the purpose of protecting spaceflight operators from lawsuits at the expense of potential victims. This represents, at the minimum, an abrogation of the longstanding victim-oriented approach that the U.S. pledged to uphold, and that other States have relied upon. Congress should pass legislation that removes limited liability.

Additionally, limited liability statutes impair industry development. The commercial spaceflight industry must grow...
beyond its current customer base of very high-net-worth individuals to realize long-term expansion and profitability. However, to support that growth, private commercial spaceflight companies must first create a track record of safe flights. The limited liability model inhibits this process by discouraging the risk-averse mass-market customer, thereby restricting the potential client base. This effectively mortgages the commercial spaceflight industry’s overall development to further the immediate needs of the space tourism business, which is a mere subset of the industry. As a result, other segments of private commercial spaceflight—like point-to-point operations, which is projected to provide ultra-fast transportation between any locations on Earth in two hours—suffer.

Part I of this note gives an overview of the existing law relevant to private commercial spaceflight, and argues that there is overwhelming international agreement and a longstanding policy recognizing that victims of injuries arising from spaceflight should have mechanisms for recovery. While international law imposes some restrictions on U.S. policy, it is, on balance, only a minor factor. The key issue is deficiencies in federal statutes and regulations that permit states to pass limited liability laws. Part II argues that Congress should pass legislation preempting state limited liability statutes to satisfy the dual goals of preserving the victim-oriented heritage of international space law, and promoting the healthy and prolonged growth of the commercial spaceflight industry. In light of the increasing promulgation of state limited liability statutes, Congress must act quickly.

26 See von der Dunk, supra note 2, at 407.
27 For an overview of the different types of prospective businesses that encompass the commercial spaceflight industry, see von der Dunk, supra note 2, at 403-10 (listing orbital space tourism, suborbital space tourism, suborbital private spaceflight, hotels in orbit, and private flights to the moon).
28 Point-to-point space transportation involves “climbing to an altitude outside of most of the atmosphere, maintaining a speed of Mach 5 to Mach 10 for a period of an hour or more, and then landing at a destination different from the launch point.” JACKSONVILLE AVIATION AUTHORITY, CECIL SPACEPORT MASTER PLAN (Draft) 1-2 (Mar. 2012), available at http://www.flyjacksonville.com/Cecil/Spaceport/spaceport-mp.pdf.
29 Buchanan, supra note 14.
I. THE DEVELOPMENT OF PRIVATE COMMERCIAL SPACEFLIGHT LAW

A. Overview

Private commercial spaceflight in the United States is governed by international, federal, and state law. The overarching field of space law was first institutionally recognized by the international community in 1958 when the United Nations General Assembly created the Committee on the Peaceful Uses of Outer Space to address the legal issues in space activities. The United Nations originally formed the Committee on an ad hoc basis in response to the Soviet Union’s launch of Sputnik, the first artificial satellite placed into Earth’s orbit, and soon converted it into a permanent committee. Following years of negotiations, the Committee recommended, and the United Nations unanimously voted to adopt, the landmark Outer Space Declaration of 1963. Most of that nonbinding resolution was formalized shortly thereafter by the ratification of the Outer Space Treaty of 1967, which has been described by commentators as “the foundation of . . . space law [that] . . . set the framework and cooperative tone . . . in outer space activities.” This landmark document was well-received by a

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majority of the world, having been ratified by 101 States. Indeed, the Outer Space Treaty is so widely accepted that it is part of customary international law, and may therefore apply even to countries that are not signatories. Accordingly, the “international community gives great weight to the commitments under the treaty and expects States to adhere to them.”

But by 1979, the “original euphoria” that fed the early development in the field had been “exhausted,” and no additional space law treaties have come into force since. Indeed, the last of these treaties, the Moon Agreement, has only been ratified by 13 States, none of which are major space powers. Accordingly, although the Moon Agreement “has frequently featured prominently in debates on international

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37 Wessel, supra note 32, at 292.
39 KLEINMAN ET AL., supra note 2, at 58; Wessel, supra note 32, at 297; see Andrei D. Terekhov, UN General Assembly Resolutions and Outer Space Law, Proceedings of the International Institute of Space Law 97, 103 (1997), reprinted in SPACE LAW (Francis Lyall and Paul B. Laren eds., 2007).
40 KLEINMAN ET AL., supra note 2, at 61.
41 Kopal, supra note 31, at 20.
42 Id.


Ravich, supra note 18, at 32 n.1 (citations omitted); see also Wessel, supra note 32, at 292-94.

44 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 18, 1979, 1363 U.S.T. 3 [hereinafter Moon Agreement], reprinted in UNITED NATIONS TREATIES AND PRINCIPLES ON OUTER SPACE 27-35, supra note 34.

45 Wessel, supra note 32, at 293.
space law, it has not had a large practical impact" and is now considered to be "dormant." Following that period of progress, the United Nations General Assembly, in the absence of any meaningful international support for additional treaties, returned to passing declarations of principles. These declarations operate as "the first stage in the lawmaking process, serving as a basis for negotiating international agreements on the given subjects, and as an initial formulation of future provisions of the respective treaties." They are not binding "and do not create norms of international law." Nevertheless, those declarations are "generally followed by spacefaring nations and may have attained the status of customary international law, although this has not been tested judicially." In all, there have been five declarations, the last of which was passed in 1996.

In 1984, the United States Congress, recognizing the need for "promoting the commercial space sector," began "developing a framework for commercial space transportation." The federal legislative and regulatory system is incomplete, however, and the five states most directly impacted by spaceflight have passed limited liability laws in order to fill gaps in the national structure. The last major holdout, California, finally relented in 2012. Today, almost every state

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46 Id. at 293-94.
47 KLEINMAN ET AL., supra note 2, at xviii.
49 Wessel, supra note 32, at 294.
50 Kopal, supra note 31, at 19.
51 Terekhov, supra note 39, at 97.
52 KLEINMAN ET AL., supra note 2, at 67.
54 KLEINMAN ET AL., supra note 2, at 76.
55 Id.
56 Federal legislation does not address whether spaceflight companies are liable to flight crews, spaceflight participants or their heirs. Accordingly, those issues "must instead be addressed by [s]tate law . . . ." KLEINMAN ET AL., supra note 2, at 107.
57 Those states—Virginia, Florida, New Mexico, Texas, and California—either have institutional ties to government-sponsored spaceflight, or have attracted investment from the private commercial spaceflight industry. See infra Part I.C.
58 See Assemb. B. 2243, Ch. 416 (Cal. 2012); Joe Weichman, Remaining Competitive: Extending Spaceflight Protections 10 (May 2013), available at
with a strong interest in the development of commercial spaceflight has passed legislation on the matter.\footnote{See generally Kleinman et al., supra note 2, at 107-10; Leonard David, Private Space Travel Gets a Big Boost in California, SPACE.COM (Sept. 21, 2012), http://www.space.com/17720-private-spaceflight-liability-california-law.html.}

**B. International Law Foundations for the Victim-Oriented Approach of Commercial Spaceflight**

1. The Outer Space Treaty\footnote{Outer Space Treaty, supra note 35.}

   Referred to as a “constitution for outer space” by some commentators,\footnote{Wessel, supra note 32, at 292 (quoting Helmet Tuerk, The Negotiation of the “Moon Agreement”, 52 PROC. COLLOQUIUM ON LAW OUTER SPACE 491, 493 (2010)). But see Ivan A. Vlasic, The Space Treaty: A Preliminary Evaluation, 55 CAL. L. REV. 507, 508 (1967) (“The result is a document which expresses general principles in diverse areas but breaks very little new ground. It leaves unsolved a number of problems which urgently need legal regulation.”).} the Outer Space Treaty was never truly intended to address commercial activity.\footnote{See generally Vlasic, supra note 61. It was meant to codify the Outer Space Declaration, which also did not concern private activity. Kayser, supra note 9, at 37.} It is well supported that the drafters were principally concerned with matters of global security, including the “prevention of the arms race in outer space.”\footnote{Vlasic, supra note 61, at 512; see, e.g., Blount, supra note 48, at 517-18.} Given the highly contentious nature of the Cold War era, it should come as no surprise that avoiding war took precedence.\footnote{Ravich, supra note 18, at 26.} Nevertheless, commercial activity was “to a small extent envisioned . . . [and] [t]he idea of private actors was not completely ignored.”\footnote{Blount, supra note 48, at 518.} To that point, Article VI of the Outer Space Treaty provides in pertinent part that:

   Parties to the Treaty shall bear international responsibility for national activities in outer space . . . whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space . . . shall require authorization and continuing supervision by the appropriate State Party to the Treaty.\footnote{Outer Space Treaty, supra note 35, art. VI.}

   Additionally, Article VII of the treaty provides that:
Each State Party to the Treaty that launches or procures the launching of an object into outer space . . . and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air space or in outer space . . . \[67\]

Remarkably, signatories of the treaty agreed to be responsible and liable\[68\] for the actions of private actors under their governance for their space activities.\[69\] Accordingly, Articles VI and VII serve to promote governmental regulation of private action because of, among other things, the risk of derivative liability.\[70\] Given the high expense of spaceflight at the time,\[71\] however, it was virtually unimaginable that any

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67 Id. art. VII (emphasis added).
68 For an explanation of the difference between “responsibility” and “liability,” see Kayser, supra note 9, at 31 (quoting Bin Cheng, Article VI of the 1967 Space Treaty Revisited: “International Responsibility,” “National Activities,” and “The Appropriate State”, 26:1 J. SPACE L. 7, 9 (1998) (“Responsibility means essentially . . . answerability for one’s acts and omissions, . . . for their consequences, . . . for compliance with his or her legal duties, and for any breaches thereof . . . . [L]iability is . . . the obligation to bear the consequences of a breach of a legal duty, in particular the obligation to make reparation for any damage caused, especially in the form of a monetary payment.”))). Professor Peter P.C. Haanappel analyzes the terms in the following manner:

The English text of space law treaties and other texts uses the terms “responsibility” and “liability,” and the corresponding adjectives “responsible” and “liable.” Other languages, especially the Latin ones (such as French and Spanish) only have one term, from the same source as the English “responsibility.” It is submitted that where, taking English as a guideline, “responsibility” or “responsible” is used, this essentially means “to have a duty” (the debitum from Roman law); where “liability” or “liable” is used, this essentially means ‘to have an obligation to repair, to pay damages (the obligatio from Roman law).

HAANAPPEL, supra note 33, at 8 n.48. Other scholars note that “[t]he term ‘responsibility’ has been variously defined, sometimes equated with and sometimes distinguished from the term ‘liability.’” BENDER, supra note 30, at 282.

69 Blount, supra note 48, at 518.
70 See Benjamin Perlman, Note, Grounding U.S. Commercial Space Regulation in the Constitution, 100 GEO L.J. 929, 934 (2012); see also Zhao Yun, A Legal Regime for Space Tourism: Creating Legal Certainty in Outer Space, 74 J. AIR L. & COM. 959 (2009).
71 Claude Lafleur, Costs of US Piloted Programs, SPACE REV. (Mar. 8, 2010), http://www.thespacereview.com/article/1578/1. NASA’s Mercury program, which operated six flights from 1959 to 1963, cost the equivalent of $2.1 billion in 2013 dollars, which equals $342.8 million per flight. Id. NASA’s Gemini program, which operated ten flights from 1962 to 1967, cost $9.1 billion in 2013 dollars, which equals $910.3 million per flight. Id. NASA’s Apollo program, which operated eleven flights from 1959 to 1973, cost $107.5 billion in 2013 dollars, which equals $9.8 billion per flight. Id. Finally NASA’s Space Shuttle program, which operated 134 flights from 1972 to 2012, cost $198.6 billion in 2010 dollars, which equals $1.4 billion per flight. Id. All preceding 2013 dollar amounts were calculated using the US Inflation Calculator, a website that “uses the latest US government CPI [consumer price index] data published on Sept. 17, 2013 to adjust for inflation and calculate the cumulative
non-governmental entity could participate in space activity, at least for the foreseeable future. Lack of technical expertise notwithstanding, the average cost per flight in 1967, over $600 million, would have been unaffordable.\textsuperscript{72}

While the treaty laid the groundwork for commercial space activity, there was no realistic possibility for that industry to emerge in the foreseeable future.\textsuperscript{73} Accordingly, the drafters had no reason to seriously consider addressing issues related to commercial spaceflight.\textsuperscript{74} Instead, the Outer Space Treaty should be understood to provide only general principles for subsequent lawmakers to rely and build upon.\textsuperscript{75} Most notably, the treaty does not address the key issues of enforceability and dispute resolution.\textsuperscript{76}

2. Convention on International Liability for Damage Caused by Space Objects of 1972 (Liability Convention)\textsuperscript{77}

The Liability Convention is an extension of Articles VI and VII of the Outer Space Treaty.\textsuperscript{78} As the five-year gap between the two treaties suggests, coming to an agreement regarding the specific legal issues addressed by the Liability Convention was a deliberate affair that required accounting for the differences among the drafters' legal systems.\textsuperscript{79} There was a general consensus that the treaty was essential,\textsuperscript{80} but the

\textsuperscript{72} The average price for the Mercury flights was $342.8 million, and the average price for the Gemini flights was $910.3 million, which, if averaged, gives an average flight cost of $626.6 million. See supra note 71.

\textsuperscript{73} GOH, supra note 19, at 163.

\textsuperscript{74} See Blount, supra note 48, at 518.

\textsuperscript{75} See BRUCE A. HURWITZ, STATE LIABILITY FOR OUTER SPACE ACTIVITIES IN ACCORDANCE WITH THE 1972 CONVENTION ON INTERNATIONAL LIABILITY FOR DAMAGE CAUSED BY SPACE OBJECTS 9 (1992).

\textsuperscript{76} GOH, supra note 19, at 29.


\textsuperscript{78} Liability Convention, supra note 77; see also KAYSER, supra note 9, at 33; HURWITZ, supra note 75, at 9.

\textsuperscript{79} See KAYSER, supra note 9, at 33.

\textsuperscript{80} HURWITZ, supra note 75, at 13.
necessary detailed legal work\textsuperscript{81} precluded a repeat of the speedy drafting process of the Outer Space Treaty.\textsuperscript{82} And although the spacefaring nations clearly had an interest in the matter, non-space powers were also eager to bring about an agreement that would protect them in the event of accidents they believed were certain to arise.\textsuperscript{83} The final product reflected those concerns, and supports the view that the Liability Convention is “victim oriented.”\textsuperscript{84} Therefore, by ratifying the Convention, the United States implicitly recognized that activities in outer space, while important, are dangerous and must provide injured parties with a means for compensation.\textsuperscript{85}

To accomplish its framers’ victim-oriented goals, the Liability Convention sets forth a regime to govern liability for damage inflicted during space activities.\textsuperscript{86} The drafters expanded upon the Outer Space Treaty by clarifying formerly uncertain terms and ideas.\textsuperscript{87} Also, the Convention provides parties with a mechanism to adjudicate disputes and grant relief.\textsuperscript{88} Although it is arguable that the Liability Convention’s additions to the Outer Space Treaty have thus far not resulted in tangible, or even theoretical, benefits for victims,\textsuperscript{89} it nevertheless still represents the international community’s collective intent to “restore injured parties to their pre-accident condition.”\textsuperscript{90}

\textit{a. Damages}

Article I of the Liability Convention defines damages—a previously undefined term in space law—as the “loss of life, personal injury or other impairment of health; or loss of or damage to property of States or of persons, natural or juridical, or property of international intergovernmental organizations.”\textsuperscript{91} In regard to personal injuries, Article I encapsulates both

\textsuperscript{81} See Kayser, supra note 9, at 33.
\textsuperscript{82} See Vlasic, supra note 61, at 507.
\textsuperscript{83} See Hurwitz, supra note 75, at 10.
\textsuperscript{84} Id. at 9-10.
\textsuperscript{85} See generally id. at 10-11 (discussing the compensation scheme developed); see also Kayser, supra note 9, at 47-52 (discussing the agreement among the international community that victims are entitled to means for recovery in incidents related to outer space activities).
\textsuperscript{86} Liability Convention, supra note 77; see also Hurwitz, supra note 75, at 9-10; Kayser, supra note 9, at 33.
\textsuperscript{87} See Kayser, supra note 9, at 33.
\textsuperscript{88} Liability Convention, supra note 77.
\textsuperscript{89} See, e.g., Goh, supra note 19, at 2-3; von der Dunk, supra note 19, at 200, 205-06.
\textsuperscript{90} Bender, supra note 30, at 313.
\textsuperscript{91} Liability Convention, supra note 77.
direct damages—physical injuries and illnesses—and also indirect damages, such as lost wages, pain and suffering, and humiliation.92 While the treaty text does not explicitly include indirect damages in its definition of damages, most scholars agree that victims can recover for them.93 Indeed, allowing for recovery of indirect damages would comport with both the victim-oriented heritage of outer space law,94 and also with other, similar international law.95 No similar debate exists regarding the comparatively straightforward area of both direct and indirect property damage.96

b. Liability

Next, the Convention addresses liability in several places. Article II provides that “[a] launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the Earth or to aircraft in flight.”97 Article I, Section C defines launching State in four ways:

1. “[a] State which launches . . . a space object,”98
2. “[a] State which . . . procures the launching of a space object,”99
3. “[a] State from whose territory . . . a space object is launched;”100 and
4. “[a] State from whose . . . facility a space object is launched.”101

Additionally, “[t]he term ‘launching’ includes attempted launching.”102 Read together with Article VI of the Outer Space Treaty, under Article II of the Liability Convention, a

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92 See KAYSER, supra note 9, at 47-49.
93 See, e.g., HURWITZ, supra note 75, at 13-16 (concluding that the Liability Convention governs indirect damages based upon analysis of legislative history and analogous international agreements); KAYSER, supra note 9, at 49-50 (arguing that the Vienna Convention on the Law of Treaties supports inclusion of indirect damages). But cf. BENDER, supra note 30, at 301-02 (arguing that “[a] knowledgeable United States commentator is . . . on record as stating the Liability Convention does not permit . . . indirect damages” and that international law generally allows for narrower recovery).
94 See HURWITZ, supra note 75, at 14-16.
95 See id. at 16-18 (cataloguing recognition of indirect damages in areas such as air law and nuclear energy law).
96 See KAYSER, supra note 9, at 47-49.
97 Liability Convention, supra note 77, art. II.
98 Id.
99 Id.
100 Id.
101 Id. This note will refer to those four definitions as being part of the launch, procurement, territory, and facility clauses, respectively.
102 Id. But this more expansive definition of launching may not survive a more probing analysis. For a detailed look at the potential inadequacy of the definition, see HURWITZ, supra note 75, at 20-21.
government is both internationally responsible and strictly liable for damages inflicted below Earth’s orbit by a private actor, such as a private commercial spaceflight company, so long as that government qualifies as a launching State.

While Article I, Section C makes it clear that a State is responsible for its own activities in space, when it comes to determining who is liable for damages arising out of private commercial spaceflight, the “launching State” designation can become a source of controversy. It is uncertain what private actions will trigger State liability under the procurement, territory, and facility clauses of Article I, Section C.

For instance, an expansive reading of the procurement clause would find that there is State liability even when its “nationals have [merely] financed or ordered the launching.” Under this scenario, a private actor could be making his or her State liable “against its will.” Alternatively, it may be argued that no State “procures the launching” when a private company contracts with another private company for a space launch, but without any government involvement.

This issue also arises under the facility clause because of the advent of privately-owned spaceports, which calls into question whether they may legally be designated as State facilities. It is more settled, on the other hand, that when the facility is State-owned, liability is proper whether it is located in “foreign countries . . . outer space, on the high seas or the

103 See Outer Space Treaty, supra note 35; Liability Convention, supra note 77.
104 von der Dunk, supra note 2, at 410.
105 See id. at 410-11.
106 Id.
107 HURWITZ, supra note 75, at 22.
108 Id.
109 See von der Dunk, supra note 2, at 411.
110 “A spaceport is the infrastructure at either the origin or destination of a spaceflight. It provides the essential infrastructure and related ground processing operations needed for space access as well as the facilities, organizations, and operations required to safely manage spaceflight.” ADVANCED SPACEPORT TECHNOLOGIES WORKING GROUP, BASELINE REPORT: CHARTING AMERICA’S PATH TOWARDS LOW-COST, ROUTINE ACCESS TO SPACE vii (Nov. 2003), available at http://weboflife.nasa.gov/shuttle/nexgen/Nexgen_Downloads/ASTWG/. “Many states have developed or are developing commercial spaceports, including New Mexico, Florida, Texas, Oklahoma, Virginia, Alaska, Colorado and California.” Partnerships to Advance the Business of Space: Hearing Before the Senate Committee on Commerce, Science and Transportation, Subcommittee, 113th Cong. 3 (2013) (testimony of Capt. Michael Lopez-Algeria), available at http://www.commerce.senate.gov/public/?a=Files.Serve&File_id=18d37b64-c839-46f0-a443-aeb6e47c009.
111 See von der Dunk, supra note 2, at 411.
ocean floor, or in other territories outside the national jurisdiction of any State.” 112

Finally, the territory clause is relevant in regard to assigning liability for launches that occur in territories outside any jurisdiction, such as international waters. 113 It is uncertain how the Liability Convention would apply to this type of launch because “having ‘territory’ in the international legal sense of the word is exclusively reserved for States.” 114 In sum, as a result of the uncertainties arising from the launching State designation, it would be reasonable for “concerned States to exercise their national jurisdiction to control private spaceflight in an effort to guard against liability and any obligation to pay for the damage caused.” 115

Under the victim-oriented perspective of the Convention, the advantage of having these four definitions is clear: it gives an injured party more options for recovery. 116 Articles IV and V advance this objective by providing for joint and several liability for States that jointly launch a space object. 117 Moreover, Article V forecloses potential loopholes by declaring that “[a] State from whose territory or facility a space object is launched shall be regarded as a participant in a joint launching.” 118 Accordingly, a State that permits use of its territory or facilities cannot escape liability under the Convention. 119

Additionally, the strict liability regime is justified on the grounds that the resulting damage will likely concern causes of action that are difficult to prove under a traditional negligence theory. 120 Despite huge advances in the field, private commercial spaceflight is still in its infancy and dangerous, and the technologies involved are “shrouded in a web of secrecy.” 121 The
implications of this are two-fold. First, because injured parties will likely be unable to obtain the secret information, they will encounter unjustly burdensome difficulties in proving an otherwise meritorious case. Second, the industry is still untested, and there exists neither adequate legislative clarity nor jurisprudence to provide guidance to litigants regarding how to succeed in an outer space negligence suit. In sum,

[strict] liability shows the maturity of society . . . [It] shows that society recognizes the benefits of technology and the fact that it cannot be regulated due to the many unknown dimensions involved with its development and exploitation. Yet, the overriding importance of the technology for society means that development must continue and therefore the danger is accepted under the condition that (a) the danger will, with time, fall to an acceptable (normal) level, and (b) until that time, the operator of the technology will be liable to pay compensation for damage caused by such a technology without the victim having to prove negligence.

In the end, the drafters determined that strict liability was appropriate given the danger involved both on Earth and in outer space.

In addition to supporting the imposition of strict liability, the dangerous nature of space activities also justifies the Convention not capping compensation recoverable against a launching State. To be sure, the negotiating States did consider a limit on compensation, but could not settle on an amount that was “sufficiently high to ensure that the victim would be fully compensated.”

Nevertheless, Article VI provides exceptions to strict liability in two limited situations. First, exoneration from strict liability may apply if the injured party acted with “gross negligence.” Second, if the injured party, “with intent to cause damage,” acted or failed to act, then exoneration may apply. In essence, this shifts the system to one that is more akin to fault liability. However, a launching State that failed to comport

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122 See id. at 29.
123 See id.; see also supra note 18 and accompanying text.
124 See HURWITZ, supra note 75, at 36 (alteration in original).
125 Id. at 28-29.
126 See KAYSER, supra note 9, at 51.
127 HURWITZ, supra note 75, at 56 (quoting 1969 U.N.Y.B 47) (discussing the expressions of the Argentina, Iran, and Lebanon delegations to the united nations).
128 Liability Convention, supra note 77, art. VI.
129 Id.
130 Id.
131 HURWITZ, supra note 75, at 41.
with relevant international law may be precluded from exercising that exemption.\footnote{132}{Liability Convention, supra note 77, art. VI.}

The liability scheme also changes to common-law fault liability when damage is caused by one space object to another when both are in outer space.\footnote{133}{See id. art. III. See supra note 3 (delineating when an object is in outer space).} Article III of the Liability Convention provides that:

In the event of damage being caused elsewhere than on the surface of the Earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible.\footnote{134}{Liability Convention, supra note 77, art. III.}

Because the drafters were predominantly concerned with non-commercial spaceflight,\footnote{135}{See id.; GOH, supra note 19, at 163.} they intended for Article III to apply only to “a collision between space objects in outer space.”\footnote{136}{HURWITZ, supra note 75, at 32-33.} Moreover, the desire to protect victims that is expressed in other parts of the Convention\footnote{137}{See supra notes 82-88 and accompanying text.} is absent in Article III, which operates on the theory that all parties able to achieve spaceflight are sufficiently sophisticated to overcome the hurdles that impact non-space-faring parties.\footnote{138}{See id.; G0H, supra note 19, at 165.} Additionally, they “have assumed the risks of conducting these activities: none should be a privileged victim.”\footnote{139}{See KAYSER, supra note 9, at 51.} Nevertheless, the launching State is still liable for the damages caused by those “persons for whom it is responsible.”\footnote{140}{Liability Convention, supra note 77, art. III.} Although that term is not explicitly defined,\footnote{141}{HURWITZ, supra note 75, at 35.} it may be inferred that certain parties who fall within the definitions set forth in Article I, Section C qualify.\footnote{142}{See id.; Liability Convention, supra note 77, art. I(c).} This means that even for damages caused by non-government actors in orbit and beyond, the State may be liable, albeit not absolutely.\footnote{143}{Liability Convention, supra note 77, art. II-IV.}

Additionally, States can find some relief from liability in Article VII, which bars some individuals from bringing a claim under the Liability Convention.\footnote{144}{Id. art. VII.} Specifically the Convention does not apply to “[f]oreign nationals during such time as they are participating in the operation of that space object...
during such time as they are in the immediate vicinity of a planned launching or recovery area as the result of an invitation by that launching State.”145 The drafters’ reasoning for this carve-out follows their Article III logic that a consenting party should not be given privileged victim status.146 However, even in this situation, questions regarding the Convention’s applicability may arise in cases where foreign tourists become injured during a spaceport visit to observe launch activities.147 Given the trend toward making spaceports major tourist destinations,148 this could be a void in the international law field.149 In that situation, foreign nationals may simply bring suit outside of the provisions of the Liability Convention.150

c. Dispute Resolution and Recovery

The Liability Convention does not allow for a private cause of action.151 Instead, under Article VIII, the right to bring claims is exclusive to “[a] State which suffers damage, or whose natural or juridical persons suffer damage.”152 This means that in any incident, up to three States may have a cause of action: “the State where injury or damage occurs, the State of nationality of the individual victim(s), and the State of permanent residence of the individual victim(s).”153 Under this system, a hierarchy of decreasing priority prevents overlapping claims.154 Accordingly, the “[s]econd and third ranked States cannot present claims unless the preceding State chooses not to exercise its right to do so.”155 Moreover, the claim must be presented to “a launching State.”156

For a private spaceflight company, one of the most constraining aspects of the Liability Convention’s claim process is that it must rely on a State to bring a claim, or petition the State to act.157 Worse still is that the only proper target of a suit

145 Id. art. VII.
146 HURWITZ, supra note 75, at 44-46.
147 Id.
148 See Jesse McKinley, Spaceport America Eyes the (Near) Future, N.Y. TIMES (Sept. 7, 2012), http://travel.nytimes.com/2012/09/09/travel/spaceport-america-eyes-the-near-future.html (“[O]fficials say they expect to draw as many as 200,000 visitors a year to see the spaceport.”).
149 HURWITZ, supra note 75, at 44.
150 Id.
151 Liability Convention, supra note 77, art. VIII; von der Dunk, supra note 2, at 413.
152 Liability Convention, supra note 77, art. VIII.
153 HURWITZ, supra note 75, at 49.
154 Liability Convention, supra note 77, art. VIII.
155 HURWITZ, supra note 75, at 49.
156 Liability Convention, supra note 77, art. VIII.
157 See KAYSER, supra note 9, at 52-53; HURWITZ, supra note 75, at 50.
under this system is another State. Outside those options, the private spaceflight company has “neither any recourse nor accountability under the . . . Convention.” Further, because of the required involvement of State actors, the decision to bring suit is an inherently political decision with potential diplomatic ramifications. In fact, Article IX requires that claims be “presented to a launching State through diplomatic channels.” The State action requirement is exacerbated by the one-year statute of limitations set forth in Article X. Although a time limit on the presentation of claims is not per se unreasonable, it certainly qualifies as a source of uncertainty for the private actor.

Even if the private company is able to persuade its government to bring a claim, the procedures set forth by the Convention are unwieldy and untested. Article XIV states that the dispute will be settled by a Claims Commission, a three-member, ad hoc, quasi-judicial body whose decisions are only “final and binding if the parties have so agreed.” Absent such an agreement, a decision is merely advisory. Additionally, the Liability Convention does not provide for any meaningful procedural rules. Instead, Article XVI only directs that “the Commission shall determine its own procedure,” and that it “shall determine the place or places it shall sit and all other administrative matters.” Furthermore, if the suit is successful, there is no explicit requirement for the State to transfer its award to a victim. As a testament to the drafters’ own uncertainty over whether States would adopt the claims

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158 Liability Convention, supra note 77, art. II-V.
159 Yun, supra note 70, at 966.
160 See HURWITZ, supra note 75, at 50-51.
161 Liability Convention, supra note 77, art. IX (emphasis added).
162 Id. art. X.
163 See GOH, supra note 19, at 37.
164 Id.
165 To date, no claims have been fully adjudicated via the Claims Commission procedures of the Liability Convention. Weeden, supra note 21, at 2. In fact, the 2009 collision between a U.S. satellite, the Iridium 33, and a Russian satellite, the Cosmos 2251, which seemed to present a storybook opportunity to test the Liability Convention, had its one-year statute of limitation under the Liability Convention pass without any party bringing a claim. Id.
166 Liability Convention, supra note 77, art. XIV.
167 Id. art. XIX. As the Brazilian delegation to the United Nations astutely observed, “it was doubtful that a provision in any convention would become binding merely because it was said to be binding.” HURWITZ, supra note 75, at 59.
168 GOH, supra note 19, at 38.
169 Liability Convention, supra note 77.
170 Id. art. XVI.
171 Id.
172 HURWITZ, supra note 75, at 50.
procedures, Article XI does “not require the prior exhaustion of any local remedies,” nor does it “prevent a State, or natural or juridical persons it might represent, from pursuing a claim in the courts or administrative tribunals or agencies of a launching State.”  

3. The International Community’s Collective Intent

The Outer Space Treaty and Liability Convention, read in conjunction, illustrate a major tenet of existing international space law that must translate into commercial space law as well: the State has obligations to uphold, including maintaining the victim-oriented system that it has supported for decades. As applied to commercial spaceflight, that means a State should, at a minimum, recognize the fault liability regime, if not a strict liability regime, and also the possibility of recovery for indirect damages. Additionally, as the lack of use and the confusing rules of the Liability Convention’s claims process make clear, that portion of the treaty’s relevance in the commercial realm is questionable. Accordingly, it is proper for the State to take a more direct approach in regard to adjudicating disputes, while still adhering to the victim-oriented tradition established in international law.

C. United States Federal Law Continues the Victim-Oriented Tradition

1. Commercial Space Launch Act (Launch Act)

Prior to 1984, no agency was explicitly authorized to regulate private commercial spaceflight. The example of Space Services, Inc. is instructive. In its successful efforts to achieve the first launch of a space object by an American company without direct government participation, Space Services negotiated with over a dozen federal agencies over a

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173 Liability Convention, supra note 77, art. XI.
174 See Kayser, supra note 9, at 33; Hurwitz, supra note 75, at 9-10.
175 See Bender, supra note 30, at 313-14.
176 See von der Dunk, supra note 19, at 200, 205-06.
177 See von der Dunk, supra note 2, at 411 (“[C]oncerned [S]tates [should] exercise their national jurisdiction to control private spaceflight in an effort to guard against liability and any obligation to pay for damage caused.”).
179 Kayser, supra note 9, at 79.
period of six months\textsuperscript{180} to gain government approval.\textsuperscript{181} Among other agencies, NASA, the Coast Guard, Central Intelligence Agency, Department of Defense, Department of State, Federal Aviation Administration, Federal Communications Commission, and Internal Revenue Service all had a hand in regulating a private launch.\textsuperscript{182} The process was slow, unpredictable, expensive, and not conducive to smooth business operation.\textsuperscript{183}

Accordingly, Congress passed the Launch Act in 1984 to promote the commercial spaceflight industry.\textsuperscript{184} Additionally, it sought to simultaneously develop a system to protect the public, principally via the licensing of spaceflight operators.\textsuperscript{185} Moreover, Congress intended to create a favorable climate for private actors by dramatically cutting down on bureaucratic hurdles and centralizing all authority to regulating the commercial spaceflight industry to the Secretary of Transportation.\textsuperscript{186} To that end, Congress granted the Secretary of Transportation oversight of the recently created Office of Commercial Space Transportation\textsuperscript{187} and control over licensing agreements with private actors.\textsuperscript{188} Nevertheless, the Secretary must act in a manner that is “consistent with any obligation assumed by the United States in any treaty, convention, or agreement that may be in force between the United States and any foreign nation.”\textsuperscript{189}

Congress subsequently amended the Launch Act in 1988 to reflect “the necessity [of compensating] individuals for damages incurred in the course of space exploration.”\textsuperscript{190} Under the updated statute, there is a three-tier risk allocation structure\textsuperscript{191} that creates a guaranteed government fund in the event that private insurance is insufficient to cover all of the damages.\textsuperscript{192} In the first tier, a private spaceflight operator is

\begin{footnotesize}
\textsuperscript{180} Id. at 80-84.
\textsuperscript{182} KAYSER, supra note 9, at 80-84.
\textsuperscript{183} See id. at 85-90.
\textsuperscript{184} Id.
\textsuperscript{185} Id.
\textsuperscript{187} KLEINMAN ET AL., supra note 2, at 105-06.
\textsuperscript{188} 51 U.S.C. § 50909 (2012).
\textsuperscript{189} Id. § 50921(d).
\textsuperscript{190} Lauren S. B. Bornemann, This is Ground Control to Major Tom . . . Your Wife Would Like to Sue But There’s Nothing We Can Do . . . . The Unlikelihood that the FTCA Waives Sovereign Immunity for Torts Committed by United States Employees in Outer Space: A Call for Preemptive Legislation, 63 J. AIR L. & COM. 517, 531-32 (1998).
\textsuperscript{191} KLEINMAN ET AL., supra note 2, at 105-06.
\textsuperscript{192} Bornemann, supra note 190, at 531.
\end{footnotesize}
liable up to its maximum probable loss, a case-by-case determination “capped at $500 million in 1988 dollars [that is] adjusted for inflation.” Compensation in excess of the maximum probable loss is governed by the second tier, which is paid through a public fund maintained by the federal government. Under the third tier, once liability exceeds $2 billion in 1988 dollars, the private actor is again responsible for payment. In doing so, Congress effectively protects private actors from unlimited liability via its allocation of up to $1.5 billion toward damages.

This addresses one of the chief criticisms of the Liability Convention—the lack of a cap on compensation—although the State is still subject to unlimited liability. By agreeing to the creation of the second tier of repayment, however, “[t]he United States has . . . committed itself to pay for negligence claims to which it was not even a party.” This practice comports with the victim-oriented view of space law originally espoused by the Liability Convention, and represents a tacit agreement to its ideals by the United States Congress while still promoting private development. Indeed, “[i]n the interconnected world of the twenty-first century, the ‘one-nation-go-it-alone’ model . . . is becoming increasingly anachronistic.”

2. Commercial Space Launch Amendments Act of 2004 (CSLAA)

Congress’s passage of the Commercial Space Launch Amendments Act of 2004 signaled to aerospace companies that the federal government supported the efforts of the private sector to carry passengers into space. Specifically, the CSLAA

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193 KLEINMAN ET AL., supra note 2, at 105.
194 Id. at 106.
195 Id.
196 Id.
197 See KAYSER, supra note 9, at 51.
198 Bornemann, supra note 190, at 532.
201 Id.
202 See National Space Policy of the United States of America (June 28, 2010), available at http://www.whitehouse.gov/sites/default/files/national_space_policy_6-28-10.pdf (recognizing that “a robust and competitive commercial space sector is vital . . . . The United States is committed to encouraging and facilitating the growth of a U.S. commercial space sector.”).
“authorized private individuals to pay for, and commercial space entities to provide, space travel.”

The CSLAA imposes only minimal requirements on space flight participants, the most important of which, arguably, is that they give “written informed consent.” The CSLAA’s requirement for informed consent is a logical extension of the Launch Act’s licensing scheme in that both operate as preventative measures that attempt to improve safety. Because of the multitude of risks associated with space travel, it is reasonable to assume that the required waivers will be exceedingly comprehensive and cautiously drafted to avoid liability. Indeed, some spaceflight operators will go to extreme lengths to demonstrate the validity of waivers. For example, Space Adventures, the “first and only company” to have sent non-astronauts into space, explicitly includes a “waiver signing ceremony” in its default suborbital spaceflight itinerary.

3. The U.S. Congress’s Failure to Act

The Launch Act and CSLAA continue where the Outer Space Treaty and the Liability Convention leave off by addressing unresolved issues in commercial spaceflight and liability. Additionally, Congress crafted legislation that maintains the spirit of those two treaties by providing for a fund that supplements the insurance requirements while simultaneously

203 KLEINMAN ET AL., supra note 2, at 80.
204 See id. at 95-97.
205 51 U.S.C. § 70102(c)(13)(c). Though not explicitly regulated by statute, an area of increasing relevance is whether the FAA’s hands-off approach regarding passenger fitness to fly is adequate, because the current rules leave the “medical screening process up to the commercial space vehicle operators.” Julielynn Wong, Doc, Am I Fit to Fly Into Space?, FORBES (Jan. 10, 2013), http://www.forbes.com/sites/singularity/2013/01/10/doc-am-i-fit-to-fly-into-space/.
206 51 U.S.C. § 70102(a)(12)-(15)
207 See supra notes 15-17 and accompanying text.
208 See, e.g., Pamela L. Meredith & Marshall M. Lammers, Commercial Spaceflight: The “Ticket to Ride”, 25 No.1 AIR & SPACE LAW. 4 & n.56 (2012) (citing N.M. Laws 8, § 4 as a sample exculpatory clause: “WARNING AND ACKNOWLEDGMENT: I understand and acknowledge that under New Mexico law, there is no liability for injury to or death sustained by a participant in a space flight activity provided by a space flight entity if the injury or death results from the inherent risks of the space flight activity . . . .”).
addressing unlimited liability for private actors. But in failing to specifically address liability for amounts less than $500 million and more than $2 billion in the CSLAA, Congress has ceded the issue to the states. This inaction, when combined with the various states’ limited liability statutes, represents a symbolic derogation of the United States’ preexisting obligation under the Liability Convention to allow for victims to recover from harm.

D. State Limited Liability Statutes Are Contrary to the Victim-Oriented Regime

Because spaceflight operators are still liable for an amount up to the maximum probable loss, states have passed limited liability statutes completely absolving spaceflight operators from liability, in a race to the bottom. As a supplement to the federal requirement for waivers, several states have passed laws limiting the liability of companies offering human spaceflight services. Fittingly, those states—Virginia, Florida, New Mexico, Texas, and California (collectively, the “space states”)—also tend to have privately funded and operated spaceports. Additionally, businesses have proposed to build spaceports in Alabama, Washington, Hawaii, Wisconsin, Wyoming, Indiana, and multiple locations in Texas, all of which are the headquarters, states of incorporation, or anticipated expansion sites of the major private spaceflight companies. The motivation is clear: companies with existing space operations want limited liability

212 Id. § 70112.
213 See infra Part I.C.
214 See BENDER, supra note 30, at 313.
215 Id. at 109-10.
216 VA CODE ANN. §§ 8.01-227.8-.10 (2007).
218 N.M. STAT. ANN., § 58-31-1 to -17 (West 2013).
219 TEX. LOC. GOV'T CODE ANN. § 507.103 (West 2013).
220 CAL. GOV'T CODE § 13999.3 (West 2013).
221 KLEINMAN ET AL., supra note 2, at 108-09. Currently Alaska and Oklahoma house spaceports but have not passed limited liability laws. Weichman, supra note 58, at 7-10; Thomas Brannen, Comment, Private Commercial Space Transportation’s Dependence on Space Tourism and NASA’s Responsibility to Both, 75 J. AIR L. & COM. 639, 656-59 (2010).
222 KLEINMAN ET AL., supra note 2, at 108 (2012).
223 Id.
States rightly believe that they can attract private operators by passing limited liability laws.\textsuperscript{226} In broadly analyzing the five state statutes, it is apparent that they share many similarities with only minor differences.\textsuperscript{227} Each state specifies the necessary language that a waiver must contain to limit a spaceflight operator’s liability, as per the CLSAA’s requirement.\textsuperscript{228} And while the statutes all limit liability, none of them exempt gross negligence or intentional torts.\textsuperscript{229} In fact, Florida, New Mexico, and California also include carve-outs for when the operator had “actual knowledge” or “should have known” of the danger.\textsuperscript{230}

As a result of most states not having limited liability laws, choice of law issues will likely apply in the event of a spaceflight accident.\textsuperscript{231} Nevertheless, a majority of jurisdictions in the United States generally enforce exculpatory clauses.\textsuperscript{232} Therefore, even if a plaintiff can win on the choice of law issue, and convince a court to apply the law of a jurisdiction other than the state of contract formation, the plaintiff may still lose on the merits.\textsuperscript{233} This is because courts will likely treat the spaceflight industry more like expeditions to Mount Everest or

\textsuperscript{225} See Meredith & Lammers, supra note 208, at 4. Even where a state already has a limited liability statute, commercial spaceflight companies have pushed for even greater limits on suits. Irene Klotz, Virgin Galactic Pushing for New Mexico Liability Relief, SPACE NEWS, Nov. 21, 2012, http://www.spacenews.com/article/launch-report/32476virgin-galactic-pushing-for-new-mexico-liability-relief.

\textsuperscript{226} KLEINMAN ET AL., supra note 2, at 108. See Edward Helmore, Virgin Threatens to Pull out of Projected Spaceport, GUARDIAN (Jan. 12, 2013), http://www.guardian.co.uk/science/2013/jan/13/branson-virgin-space-tourism-threat (“A spokeswoman for Virgin Galactic said: ‘Without the legislation in place, [the state] will be perceived as a place that is less friendly to space business . . . .’”); Mark Whittington, New Mexico Space Tourism Dependent on Passage of “Informed Consent” Bill, EXAMINER.COM (Jan. 4, 2013), http://www.examiner.com/article/new-mexico-space-tourism-dependent-on-passage-of-informed-consent-bill (“A group of trial lawyers succeeded in watering down [limited liability] legislation in California, which some suggest led to XCOR moving some of its operations to Midland, Texas [which confers greater protections to spaceflight companies].”).

\textsuperscript{227} KLEINMAN ET AL., supra note 2, at 110.

\textsuperscript{228} Id.; see, e.g., Meredith & Lammers supra note 208.

\textsuperscript{229} KLEINMAN ET AL., supra note 2, at 110.

\textsuperscript{230} Fla. Stat. § 331.501 (2012); S.B. 9, 49th Leg., Reg. Sess. (N.M. 2010); Assemb. B. 2243, Ch. 416 (Cal. 2012); Meredith & Lammers, supra note 208, at 6-7.

\textsuperscript{231} See Meredith & Lammers, supra note 208, at 6-7.

\textsuperscript{232} See, e.g., Appalachian Ins. Co. v. McDonnell Douglas Corp., 214 Cal. App. 3d 1 (Ct. App. 1989) (rejecting argument that exculpatory clause was neither unconscionable nor unenforceable in a case involving the failure of a telecommunications satellite to reach its desired orbit).

\textsuperscript{233} See Meredith & Lammers, supra note 208, at 6-7.
Antarctica and less like the commercial airline industry, and bar recovery against operators.\footnote{See id. But cf. Rob Coppinger, Space Tourism: Fly at Your Own Peril, FLIGHTGLOBAL (Apr. 11, 2009), http://www.flightglobal.com/news/articles/space-tourism-fly-at-your-own-peril-324978 (quoting Virgin Galactic president Will Whitehorn’s opinion on this issue: “Informed consent has worked quite well in scuba diving, but in other industries it hasn’t. You still have to build your business on the basis [that] those protections don’t exist because you’re talking about people’s lives. That is the commercial aviation background coming to the fore.”) (alteration in original).}

Despite differences between the states’ various limited liability statutes and enforcement, their very existence goes against the principles and ideals set forth in the Liability Convention and Launch Act.\footnote{See supra Part I.B.2 and Part I.C.1.} As a general matter, the state laws bar a plaintiff from recovery once they have been informed of the risk and consented to be a spaceflight participant.\footnote{KLEINMAN ET AL., supra note 2, at 108.} A provision of that sort is absent from the Liability Convention, which recognizes only strict and common-law fault liability.\footnote{Liability Convention, supra note 34, art. II, IV.} Even when the Convention refuses to grant “privileged victim” status on the theory that a party has assumed the risk of spaceflight, fault liability, at a minimum, still applies.\footnote{Id.} The space states, in their attempt to promote business development, have acted against the shared international ideals that the United States, via Congress, agreed to.\footnote{See KLEINMAN ET AL., supra note 2, at 107.}

II. FEDERAL PREEMPTION AS A MEANS TO COMPENSATE VICTIMS AND FOCUS INDUSTRY GROWTH

The current system of international, federal, and state law should ideally operate to promote two goals. First, the international and United States systems of space law should ensure that victims of spaceflight accidents are properly compensated for the damages they suffer.\footnote{See supra Part I.B.2 and Part I.C.1.} Second, the U.S. federal and state systems of space law should encourage the growth of commercial spaceflight operations.\footnote{See supra Part I.B–C.}

On its face, victim compensation and business growth seem to be not only incompatible goals, but polar opposites. Indeed, if the short-term economic gains that are to be achieved through space tourism are the goal, then that assessment is likely correct. Current space tourism, which only consists of
sending customers on a short two-hour trip to the lower fringes of outer space with a return to the original launch site, benefits from laws that limit liability. Those flights are more akin to extreme sports, which are generally immune from lawsuits when participants sign waivers. Moreover, it is inarguable that those individual companies have an interest in limiting their financial liability if at all possible.

But focusing so closely on crafting a legislative regime that supports only this type of space tourism specifically, and not commercial spaceflight generally, is a gamble. By allowing for limited liability, the United States risks being burdened with an inflexible statutory structure that may no longer support the originally intended business model. If space tourism is the only prospective use of the technologies being developed, then it is perhaps conceivable to maintain the limited liability system. That is not the case, however. To wit, emerging technologies, including point-to-point transport, hotels in outer space, and long-distance voyages, are currently under development, all of which envision different goals and require different governmental intervention. In fact, analysts speculate that they may “eventually even supplant” the space tourism market. In this scenario, because those activities also

242 A more complete definition of space tourism would encompass both the above-mentioned sub-orbital space tourism, but also orbital space tourism. von der Dunk, supra note 2, at 403-08. Examples of orbital space tourism include visits to the International Space Station by private citizens Dennis Tito in 2001, Mark Shuttleworth in 2002, Greg Olsen in 2005, Anousheh Ansari in 2006, and Charles Simonyi in 2007. Id. at 404.


244 See supra Part I.D.

245 This would also include point-to-point spaceflight, hotels in orbit and in space, and trips to the moon. See von der Dunk, supra note 2, at 407-11.

246 Id.

encompass the universe of private commercial spaceflight, it may be necessary to dismantle the limited liability model and attempt to impose an alternative that better reflects the direction of the industry.\textsuperscript{249} Imposing a system of law so focused on just one facet of the industry, and potentially at the expense of the others, is ill-advised.

Regardless which of these emerging technologies develops first, the industry must prioritize safety in order to achieve marketplace success.\textsuperscript{250} As then-Virgin Galactic President Will Whitehorn explained, his company’s goal with its space tourism business is to first establish a safety record of no more than one accident per 50,000 flights, which would represent a statistic on par with the commercial airline industry.\textsuperscript{251} After accomplishing that goal, Virgin can then transition to offering point-to-point flights,\textsuperscript{252} presumably because they view it as a profitable enterprise.\textsuperscript{253} Additionally, this system of flights could find acceptance in the cargo transport industry and by the U.S. military,\textsuperscript{254} markets that space tourism cannot fill. At Virgin’s current expected rate of progress, however, it will take decades to log the number of flights necessary to institute an ideal safety record.\textsuperscript{255}

Accordingly, space tourism companies should increase the amount of flights they offer to more quickly reach the goal of offering point to point flights. Beyond demonstrating safety, they must simultaneously dispel the perception that their product is reserved for the wealthy, and build mass market appeal. However, making more flights available is counter-productive if there are not enough people to fill the seats. As it stands, market research shows that today’s dominant potential customer base is predominantly male, in his mid-fifties, and wealthy.\textsuperscript{256} But if ticket prices decrease, more people will be

\textsuperscript{249} Grossman, supra note 244 (quoting Professor Matthew Schaefer: “Once we get to 1000 flights a day for point-to-point suborbital travel, New York to Tokyo in an hour and a half . . . , then you may need a different regulatory structure[,]”).


\textsuperscript{251} von der Dunk, supra note 2, at 407-08.

\textsuperscript{252} Id. at 408.

\textsuperscript{253} See BEARD & STARZYK, supra note 248, at 66.

\textsuperscript{254} Jeff Foust, First Steps Towards Point-to-Point Spaceflight, THESPACEReview.COM (Feb. 23, 2009), http://www.thespacereview.com/article/1311/1.

\textsuperscript{255} von der Dunk, supra note 2, at 408.

\textsuperscript{256} See BEARD & STARZYK, supra note 248, at 1-2.
increasingly willing to travel, thereby expanding the market.\footnote{257}{\textit{Id.} at 20-21.} Although it seems counterintuitive, for spaceflight to reach that wider audience, the industry must reduce prices, shed its playboy status, and become boring, mundane, and safe.\footnote{258}{See ADEBOLA ET AL., supra note 8, at 36-37, 77.}

State limited liability statutes may therefore be more acceptable if the only issue was promoting space tourism at the expense of properly informed and consenting participants. Advocates of that position would still need to justify circumventing the United States’ international obligations under the ideals of the Outer Space Treaty and the Liability Convention, but the position may nevertheless be defensible in the interest of economic development. However, the space states are focused on crafting a narrow response to a singular issue—space tourism—whereas there exists an entire commercial spaceflight industry that encompasses several different, but related sectors. That means those limited liability statutes may have the actual effect of hurting the industry. By taking away a potential plaintiff’s ability to bring suit, the states are foreclosing a class of customers, the risk-averse, to the spaceflight industry. This also necessarily lessens a company’s ability to create a track record of safety, thereby slowing the path to the potentially more profitable mass market,\footnote{259}{See \textit{BEARD \\& STARZYK}, supra note 248, at 52, 59.} and a more diversified private commercial spaceflight business. Because the states’ limited liability statutes arguably impact both victims and the spaceflight companies negatively, Congress should enact national standards that disallow their existence.

Because the space states are all self-interested in attracting businesses, it is unrealistic to expect that they will unilaterally repeal their limited liability statutes,\footnote{260}{See, e.g., Grossman, supra note 244; Whittington, supra note 213.} particularly because some of those businesses are arguably committed solely to remaining space tourism companies.\footnote{261}{To the author’s knowledge, of the major space tourism companies, Virgin Galactic is the only company that has discussed plans of point-to-point transport. See von der Dunk, supra note 2, at 407-08.} In this sense, the states and those companies are similar in that they are willing to benefit at the expense of an overarching goal. The states wish to enrich themselves in favor of national and international goals, and the dedicated space tourism companies wish to enrich themselves in favor of the continued healthy...
growth of the industry at large. Accordingly, federal preemption is the most sensible solution in that it has the ability to be sufficiently far-seeing to ignore those short-term interests.

Regardless of the plan that Congress adopts, it must, at a minimum, modify or eliminate the limited liability spaceflight statues as they currently exist in the space states. As a starting point, Congress may consider amending the Launch Act’s three tier recovery system by lowering the first tier damage cap of $500 million to an amount that would adequately compensate a victim, but would not bankrupt a spaceflight company. As a supplement to that, Congress could create an “obligatory insurance regime, or [a national] compensation fund” supported by fees collected from private parties.262

Even if Congress does not accept the premise that eliminating limited liability is in the country’s best interests, a uniform national law would provide certainty for commercial spaceflight companies. As the commercial spaceflight industry continues to develop and mature, the necessity of implementing changes to the current legislative regime will only grow. If the United States is to remain the leader in outer space activities, Congress must act sooner, rather than later.

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262 See Hurwitz, supra note 75, at 57-58.
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